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ABSTRACT

This study investigated where and how secondary school teachers generated ideas linked to their work environment. A group of 146 teachers from 20 secondary schools in the Netherlands completed an adapted version of Geschka's questionnaire, which focused on (1) teachers' preferred conditions, environments, media, people, and activities before the moment of idea generation; (2) teachers' environments, time, and situation during the moment of idea generation; and (3) teachers' activities and next steps after the moment of idea generation. Results indicated that before the moment of idea generation, teachers preferred a quiet, relaxing environment. For inspiration, they went to lectures, seminars, and colleagues. They found the countryside helpful. When stuck for ideas, they often thought things over and thought of other things. During the moment of idea generation, they were usually at their desk at home, or else in bed. They did not generate ideas at any particular time. In general, they preferred to be alone when generating ideas. Walking and biking were beneficial to idea generation. After an idea occurred to them, teachers wrote them down immediately and talked to experts to evaluate and develop them. Often, they thought about the ideas repeatedly. (Contains 16 references.) (SM)

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Idea Generating Among Secondary School Teachers

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Abstract

The study investigated where and in what way secondary school teachers generate ideas linked to their work environment. An adapted version of Geschka's questionnaire (1987) was completed by 146 teachers working at 20 secondary schools. The process of generating ideas was broken down into three episodes: before, during and after the moment of idea generation. Before the moment of idea generation, teachers prefer a quiet, relaxing environment. For inspiration they go to lectures and seminars and consult colleagues. The open countryside is popular, too. They also prefer media like professional periodicals and specialized books. They talk to colleagues and spouses or partners to help them generate new ideas. When they are stuck for ideas they think things over and think of other things. During the moment of idea generation, teachers usually are at home. Walking or cycling are beneficial to idea generation. Teachers also think of ideas while they are in bed. They do not generate ideas at any particular time. In general, they prefer to be alone when getting an idea. It makes no difference to them whether or not they are working under pressure of time. After an idea occurs to them, teachers write it down immediately, talk to experts to evaluate it and to develop it in further detail, searching for facts, literature, and other information supporting the idea. Often they think about the idea repeatedly.

Keywords: creativity, idea generation, illumination,

secondary school teachers

Idea Generating Among Secondary School Teachers

Introduction

We can hardly mention a human characteristic that is more inextricably bound up with human existence than creativity. Creativity is described as the ability to make or otherwise bring into existence novel and socially valued ideas (Galotti, 1994; Kellogg, 1995; Solso, 1988). Creativity encompasses the process of generating new ideas. Ideas can result in a new solution to a problem, a new method or device, or a new artistic object or form. Generating new ideas and finding new solutions are essential for surviving and vital characteristics for contributing to the development of mankind. Hennessey and Amabile (1988) state that those ideas are supposed to be original, i.e., they suit some purpose. In this context it is important that the idea is new for the person in question, and self invented (Hayes, 1981).

For centuries man has attempted to understand the process of generating new ideas. Ancient scholars assumed that new ideas came from the outside. As far back as the ninth or eighth century B.C., Homer noted that new ideas resulting, for instance, in poetry and tale, song and epic, came from the muses (Homer XXII, 347f). According to Goody (1987), idea generation often involves some kind of communication from the outside. In ancient times people thought that poets were inspired by the muses and that inspiration lay beyond their control. Phemios says to Odysseus (Od XXII. 347f): "It was a

deity that implanted poems of all kinds in my heart". And Odysseus addresses Demodocos: "I praise thee far above all mortals, Verily thou hast been taught either by a muse, a child of Zeus, or even by Apollo" (Od. VIII. 487f).

The belief that new ideas came from the outside was widely held down through the ages. Hadamard (1949) cites an extract from a letter by Mozart, who wrote: "When I feel well and in a good humor, or when I am taking a drive or walking after a good meal, or in the night when I cannot sleep, thoughts crowd into my mind as easily as you could wish. Whence and how do they come? I do not know and I have nothing to do with it. Those which please me, I keep in my head and hum them; at least others have told me that I do so" (Hadamard, 1949, p. 16).

The examples given above refer to the view that the gods, muses, or inexplicable intuition are responsible for idea generation: ideas came from the outside. In Boden's (1992) view this is a Romantic explanation.

In the second half of the nineteenth century there was an increasing scientific interest in idea generation. The literature abounds with introspective reports from renowned scholars. In a famous lecture delivered in 1908, Poincaré offers an introspective account of some mathematical inventing of his own. "One evening, contrary to my custom, I drank black coffee and could not sleep. Ideas rose in crowds; I felt them collide until pairs interlocked, so to speak, making a stable combination" (Hadamard, 1949, p. 14).

Researchers have attempted to investigate the process of generating ideas. Wallas (1926), who employed a descriptive approach, proposed four stages in the general process of idea generation: preparation, incubation, illumination, and verification. According to Solso (1988) empirical evidence for the validity of the four stages is almost nonexistent. It has not become any easier to clarify what we mean by getting new ideas. This is partly due to the inherent difficulty of the topic and the lack of scientific attention (Solso, 1988).

There is a growing interest in idea generation as an important component of professional effectiveness. For instance, Geschka (1987, 1992, 1993) has done a number of surveys in the field of business and management. Vaags and Douwes-Bolding (1988) replicated Geschka's survey among managers in The Netherlands. The aim of these studies is to explore how professionals get new ideas related to the requirements of their occupation.

Up till now no research has been conducted on idea generating among teachers. Teachers are regarded as professionals. Their job is quite demanding and society expects much from them. Student achievement depends to a large extent on their efforts and expertise. An important way to solve educational and classroom problems is by generating new ideas and solutions. Adequate solutions often are based on renewed or new ideas; consequently they are indispensable. It is therefore

a worthwhile task to investigate how teachers generate new ideas and solutions.

After reviewing several models which include the moment of illumination or the birth of an idea, Geschka (1987) and Vaags and Douwes-Bolding (1988) suggest that the process of generating ideas could be broken down into three episodes or moments: the first, preceding the moment of illumination, i.e., before the moment of idea creation; the second, during the moment of illumination, i.e., the birth of an idea; and third, following the moment of illumination, i.e., after idea creation.

The present study investigates where and in what way secondary school teachers generate ideas linked to their work environment. In this study, the concept "idea" is used to cover all aspects of teachers' work environments. The main point, however, is that the idea is new for the person in question, and self invented. The purpose of the study is to gain an understanding of the way secondary school teachers go about generating ideas. An additional aim of the study is to explore whether there are gender differences related to idea generation.

Method

Participants

First, twenty schools for secondary education were selected at random. Second, within each school 10 teachers were selected randomly as well. We received back 146 completed

questionnaires, a response rate of 73%, which is generally considered to be adequate for a mail survey (Babbie, 1995).

The sample consisted of 107 (73%) male and 39 females respondents (27%). The average age of the 146 respondents was 42.98 years. A comparison with all the teachers working in secondary schools in 1997 (CFI, 1998) shows that our sample was representative in terms of sex ($\chi^2_{(1)} = 2.17$, $p = .14$).

Instrument

The teacher questionnaire was based on a questionnaire designed by Geschka in collaboration with the Soken Institute in Japan (1993) for managers, and on the Vaags and Douwes-Bolding adaptation (1988). Some modifications were made. First, the questions had to be tailored to another professional group: secondary school teachers instead of businessmen. Second, the questionnaire in the present study explicitly specifies what is meant by a new idea. The respondents were asked to choose a number of alternatives per question, ranging from one to three depending on the nature of the question. For the questions - without alternatives - see below. (1) Which environment do you prefer for idea generation? (2) Where are you usually when you get an idea? (3) Where do you go for inspiration about ideas other than your home or office? (4) What media do you prefer for inspiration about new ideas? (5) Who do you talk to to help you generate new ideas? (6) When do you generate ideas most frequently? (7) In which situation are you more likely to get

an idea? (8) What do you do when you are stuck for ideas? (9) What activities do you typically and spontaneously do next after you have had an interesting idea? (10) What steps do you take next in your work after you have had an idea that seems worth following up?

Procedure

In a letter we asked the principals of the 20 schools to cooperate in our research and to pass on the questionnaires to 10 teachers in their school for completion. These teachers were selected randomly by the researchers using the teacher lists provided by the schools. Follow-up mailings were conducted to increase the return rate.

Results

In this section we report the percentages of teachers who gave a particular answer to the questions (Table 1). The percentages in the Table do not add up to 100 within each category, because in most cases respondents were asked to report more than one alternative per category or question.

Before the Moment of Idea Generation

First, we asked teachers about preferred conditions, environments, media, people and activities before the moment of idea generation. A vast majority of teachers prefer a quiet, relaxing environment without music (64%). When teachers were asked where they go for inspiration about new ideas other than their homes or offices, a considerable number of them said they went to lectures and seminars (30%). They also talk to

colleagues (18%) and visit the open countryside (18%). They also go to a library or reading room (16%).

When the teachers were asked what media they prefer for inspiration about new ideas, they cited professional periodicals and specialized books (45%). Periodicals (15%) and daily newspapers (15%) are less popular in this regard.

A great many teachers talk to colleagues (52%) and spouses or partners (27%) to help them generate new ideas. When teachers are stuck for ideas they think things over (26%) and think of other things (16%).

During the Moment of Idea Generation

Second, teachers were asked about environments, time and situation during the moment of idea generation. On the one hand, they said that when they get an idea, they are usually at their desk at home (28%). On the other hand, they also found walking or cycling helpful for generating ideas (16%). They also thought of ideas while lying in bed (13%). Inspection of the data shows that female teachers get ideas during household work more frequently than their male counterparts ($\chi^2_{(1)} = 4.96$, $p = .03$).

The study also looked at the time of idea generation. When teachers were asked to estimate when they generate ideas most frequently, i.e., the most fruitful part of the twenty-four hour period, they said not at any particular time (51%). Some teachers reported getting inspiration during the late evening,

whether or not in bed (28%). This finding applies more to male than to female teachers. The latter tend to be early birds, more so than their male counterparts ($\chi^2_{(1)} = 3.87$, $p = .05$).

One other item in the questionnaire asked in which situation teachers were more likely to get an idea. The majority of teachers preferred to be alone when getting an idea (76%) and favored a quiet environment as well (75%). However, female teachers were more likely to get ideas in a bustling environment than their male counterparts ($\chi^2_{(1)} = 4.68$, $p = .03$). Teachers generate more ideas (62%) when working on a problem than when doing other work (38%). It makes hardly any difference to them whether they are working under pressure of time or not (48%, respectively 52%). Nor is there hardly any difference between ideas occurring to them suddenly and ideas becoming gradually more concrete (52%, respectively 48%).

After the Moment of Idea Generation

Third, we investigated what activities teachers typically and spontaneously do next after they have had an idea. The main spontaneous activity is writing down the idea immediately (36%). Respondents also mentioned thinking about the idea repeatedly (21%).

What steps do teachers take next in their work after they have had an idea that seems worth following up? Teachers try to talk to experts to evaluate the idea (27%), they develop the idea in further detail (26%), they search for facts, literature

and other information supporting the idea (16%), and plan all further activities (17%).

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Discussion

The study investigated where and in what way secondary school teachers generate ideas linked to their work environment. The concept "idea" was used to cover all aspects of teachers' work environment. Ideas are supposed to be new for the person in question, and self invented (Hayes, 1981).

The study shows that the questionnaire originally used by Geschka (1987) could be applied successfully to gather information on the way in which secondary school teachers generate ideas. The study also illustrates the significance of breaking down the process of generating ideas into three episodes or moments, i.e., before the moment of illumination or idea creation, during the moment of illumination, and after the moment of idea creation. We have every reason to assume that the notion of three episodes can be used fruitfully in future research in this field.

Some highlights of the study are: before idea generation teachers prefer to be alone in a quiet environment. They consult colleagues, professional periodicals and specialized books. In general, during idea generation teachers are alone at home in a quiet environment. In bed turns out to be a good

place for generating new ideas. The work environment was not, however, mentioned as an appropriate place for generating ideas. After illumination, teachers write down their ideas immediately.

Compared to their male counterparts, female teachers are more likely to get ideas in a bustling environment. Women have less opportunity to stay in a quiet environment due to demanding duties at home. Results show that female teachers get ideas during household work more frequently than their male counterparts. This may reflect traditional sex roles. A recent survey demonstrates that even when both partners have full-time jobs, women still spend more time on household work (Niphuis-Nell, 1997). Evidently, it is easy to think about solving problems in one's work environment while carrying out routine tasks.

Besides the above-mentioned results, the present study has produced three findings that need to be investigated further in future research. First, the time of idea generation: most teachers do not generate ideas at any particular time. Second, the situation in which idea generation takes place, i.e. under pressure or not under pressure of time. Teachers have a slight preference for generating ideas when not under pressure of time. Third, the way ideas arise: suddenly or gradually. The difference is a mere 4% in favor of ideas arising suddenly.

References

Agentschap van het Ministerie van Onderwijs Cultuur en Wetenschappen (1998). [Branch office of the Ministry of Education Culture and Sciences]. *Totaal aantal leerkrachten voor het voortgezet onderwijs naar leeftijd en naar geslacht*. [Total number of secondary school teachers by age and sex]. Zoetermeer: CFI.

Babbie, E.R. (1995). *Survey research methods*. Belmont, CA.: Wadsworth.

Boden (1992). *The creative mind: Myths and mechanisms*. New York: Basic Books.

Galotti, K.M. (1994). *Cognitive psychology in and out of the laboratory*. Pacific Grove, Ca.: Brooks/Cole Publishing Company.

Geschka, H. (1987). *A survey among managers in the Federal Republic of Germany, in Switzerland and Austria on the generation of ideas*. Paper for the First European Congress on Creativity and Innovation. Noordwijk: Holland.

Geschka, H., & Mägdefrau, H. (1992). How businessmen generate ideas: Results of a European survey and comparison with a Japanese poll. *Creativity and Innovation Management, 1*, No. 1, 14-19.

Geschka, H. (1993). The Development and Assessment of Creative Thinking techniques: A German Perspective. In:

Isaksen, S.G. et al. (Eds.), *Nurturing and developing creativity: The Emergence of a discipline*. Norwood: Ablex.

Goody, J. (1987). *The domestication of the savage mind*. Cambridge: Cambridge University Press.

Hadamard, J. (1949). *An essay on the psychology of invention in the mathematical field*. Princeton, N.J.: Princeton University Press.

Hayes, J.R. (1981). *The complete problem solver*. Philadelphia: Franklin Institute Press.

Hennessey, B.A., & Amabile, T.M. (1988). The conditions of creativity. In R.J. Sternberg (Ed.), *The nature of creativity*, pp. 11-35. Cambridge: Cambridge University Press.

Kellogg, R.T. (1995). *Cognitive psychology*. London: Sage.

Niphuis-Nell, M. (1997). *Sociale atlas van de vrouw, deel 4. Veranderingen in de primaire leefsfeer*. [Woman's social atlas, part 4. Changes in primary life atmosphere. Rijswijk: Sociaal en Cultureel Planbureau.

Solso, R.L. (1988). *Cognitive psychology*. Second Edition. Boston: Allyn and Bacon.

Vaags, W., & Douwes-Bolding, M. (1988). *Een (inter)nationaal onderzoek naar het ontstaan van ideeën*. [An (inter)national survey of idea generation]. Eindhoven: Technische Universiteit Eindhoven.

Wallas (1926). *The art of thought*. New York: Harcourt Brace.

TABLE 1

Idea Generating Among Secondary School Teachers

Teachers' Answers	Percentage of Teachers
1. TEACHERS' PREFERRED CONDITIONS, ENVIRONMENTS, MEDIA, PEOPLE AND ACTIVITIES BEFORE THE MOMENT OF IDEA GENERATION	
Conditions for idea generation	
Quiet, relaxing environment without music	64
Environments (outside the home and office)	
Lectures and seminars	30
Colleagues	18
The open countryside	18
Library or reading room	16
Media as stimuli for ideas	
Professional periodicals and specialized books	45
Daily newspapers	15
Periodicals	15
Important people for discussing ideas	
Colleagues	52
Spouse or partner	27
What to do when you need an idea	
Think things over	26
Think of other things	16
2. TEACHERS' ENVIRONMENTS, TIME AND SITUATION DURING THE MOMENT OF IDEA GENERATION	
Environments where ideas occur	
At one's desk at home	28
During a walk or bicycle riding	16
In bed	13
Time of idea generation	
Not at any particular time	51
In the evening	18
In bed, before falling asleep	10

Table 1 continued

Situation for generating ideas	
Alone	76
Working on a problem	62
During other work activities	38
Not under pressure (time)	52
Under pressure (time)	48
In a quiet environment	75
The idea arises suddenly	52
The idea gets gradually more concrete	48
3. TEACHERS' ACTIVITIES AND NEXT STEPS AFTER THE MOMENT OF IDEA GENERATION	
Activities after getting an idea	
Writing down the idea immediately	36
Thinking about the idea again and again	21
Talking to someone about the idea	12
Next steps	
Talking to experts to evaluate the idea	27
Developing the idea further in detail	26
Searching for facts, literature and other information supporting the idea	16

Note: Percentages in the categories do not add up to 100.

Author Note

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